Vermont Association of Hospitals and Health Systems
VAHHS

2009 Recommendations of the Stroke Workgroup

November 15, 2009

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EXECUTIVE SUMMARY

Act 61 of 2009 charged the Vermont Association of Hospitals and Health Systems with convening a workgroup of neurologists, emergency department physicians and the American Heart Association to make recommendations to improve acute stroke care.

The workgroup reviewed relevant literature and gathered information from hospitals and Emergency Medical Services.

It became clear that given our state's rural nature, Vermont will be best served by a model that gives all hospitals access to the tools they need to provide initial evidence-based care to stroke patients, rather than a model that relies solely on bypassing community hospitals. To that end, the workgroup identified the following specific recommendations.

1. The workgroup should remain active for at least another year to implement the recommendations below.
2. The workgroup should review the E-911 dispatch system for recognizing and responding to stroke symptoms from EMS calls by March 30, 2010.
3. The workgroup should adopt an evidence-based EMS stroke screening tool, a treatment protocol for inclusion in the Vermont EMS statewide protocols and an implementation plan by March 30, 2010.
4. Implementation of the EMS stroke screening tool and treatment protocols should be led by EMS district medical advisors.
5. The stroke workgroup should recommend nationally accepted, evidence-based guidelines for acute stroke care by August 15, 2010 for adoption by Vermont hospitals.
6. The workgroup should explore the feasibility of, and barriers to, statewide implementation of teleradiology and telemedicine and develop recommendations by November 15, 2010.
7. The workgroup should work with tertiary care centers serving Vermont to better define the consultative expertise in stroke care they can provide to community hospitals and the attendant inter-facility treatment and transfer protocols.
8. The feasibility of a quality improvement-focused organization such as the Vermont Program for Quality in Health Care taking over the staffing of the committee should be explored before January 30, 2010.
9. The workgroup should monitor the progress of the Centers for Medicaid and Medicare Services requirement that hospitals report on their participation in a "systematic clinical database registry for stroke care" scheduled for implementation in 2011 which will allow the collection of data on the incidence, treatment and outcome of stroke care.
10. The workgroup should report again on their progress to the House Committee on Health Care and the Senate Committee on Health and Welfare by November 15, 2010.

The workgroup remains energetic and active and is already scheduling a series of meetings beginning in January 2010.

DEFINITIONS

Critical Access Hospital (CAH): A Critical Access Hospital is a hospital that is certified by the Centers for Medicaid and Medicare Services to receive cost-based reimbursement from Medicare. By definition they are small, rural hospitals. Key criteria for CAH certification include a rural location, an average length of stay of 96 hours or less and a maximum of 25 beds. Eight hospitals in Vermont are designated as a CAH.[1]

Physician Assistant (PA): A physician assistant (PA) is a healthcare professional licensed to practice medicine with the supervision of a licensed physician**.** Physicians have relatively broad delegatory authority, which permits flexible, customized team practice. PAs are licensed by the Vermont Board of Medical Practice which also licenses physicians. In hospitals PAs obtain clinical privileges through a system similar to the one used for physicians. PAs can prescribe medication.[2]

Picture Archiving and Communication System (PACS): PACS allow for the storage, retrieval, distribution and presentation of images.

Stroke: A fixed neurologic injury caused by a focal interruption of blood flow to the brain. Stroke encompasses both hemorrhagic and ischemic etiologies. For the purposes of this document, a transient ischemic attack (also known as a TIA) also falls under this rubric.

Teleradiology: Radiology done through the remote transmission and viewing of images. Teleradiology is a subset of telemedicine.

Telemedicine: The use of medical information exchanged from one site to another via video and electronic submission, including consultative, diagnostic and treatment services.

Tertiary Care: Highly specialized medical care usually over an extended period of time that involves advanced and complex procedures and treatments performed by medical specialists in state-of-the-art facilities.[3]

The Joint Commission (TJC): An accreditation organization whose mission is "t*o continuously improve health care for the public, in collaboration with other stakeholders, by evaluating health care organizations and inspiring them to excel in providing safe and effective care of the highest quality and value."* The Joint Commission is governed by a 29-member Board of Commissioners that includes physicians, administrators, nurses, employers, a labor representative, health plan leaders, quality experts, ethicists, a consumer advocate and educators. The Joint Commission is one of several organizations that accredits hospitals and has or is seeking deeming authority from the Center for Medicare and Medicaid Services which has oversight over any hospital that takes Medicare and/or Medicaid patients. In Vermont, six acute care hospitals and one critical access hospital are Joint Commission accredited.[4]

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[1] Website of the Rural Assistance Center **http://www.raconline.org/**
[2] Website of the American Academy of Physician Assistants **http://www.aapa.org/**
[3] Merriam-Webster on-line dictionary
[4] Website of The Joint Commission http://**www.jointcommission.org**

Primary Stroke Center: The Joint Commission's Primary Stroke Center Certification Program was developed in collaboration with the American Heart Association/American Stroke Association (**AHA/ASA**). Certification is available only to stroke programs in Joint Commission-accredited acute care hospitals. Programs applying for advanced certification must meet the requirements for disease-specific care certification plus additional, clinically specific requirements and expectations. [5]

CHARGE TO COMMITTEE

Act 61 of 2009 requested that the Vermont Association of Hospitals and Health Systems convene a stakeholder workgroup of physicians and the American Heart Association to develop recommendations about the provision of care to patients with stroke symptoms. The full text of the relevant portion of the act is available in Appendix B.

Specifically, the committee was charged with reviewing the status of The Joint Commission primary stroke center certification in Vermont, current services available in emergency departments and the current capacity of the emergency medical services (EMS) system in relation to stroke. The committee was asked to consider recommendations about infrastructure, triage, stabilization and EMS routing of patients, and coordination and communication between providers.

STROKE RESPONSE: AN OVERVIEW

Central to the workgroup's discussion was a common goal to make effective and timely care for acute stroke available to all Vermonters. Treatment strategies for each patient will differ depending on the cause of stroke, but the workgroup agreed Vermonters should have access to standardized evaluation and treatment protocols that are consistent with current evidence for the management of stroke, and acute stroke in particular.

Vermont's rural, dispersed population, fragile EMS infrastructure and weather conditions that impact road and air transport are all barriers to rapid access to stroke care. The workgroup's recommendations below were developed with these barriers in mind.

The term "stroke response" implies a system of care that addresses every stage in the continuum of acute stroke management. Medical and surgical options and techniques will continue to evolve in the management of stroke. Any system we look to must provide a consistent backbone of care upon which new modalities can be grafted. The stages in the continuum of acute stroke management that comprise this "backbone" are as follows:

1. The effective recognition by the public of stroke and stroke symptoms;
2. Effective and timely EMS response, recognition, stabilization, and transport to a stroke-capable hospital emergency department;
3. Effective and timely emergency department triage, evaluation, diagnosis, and appropriate treatment at the receiving hospital. This stage must include timely and dependable expert consultation that may only be available at another hospital;

[5] [5] Website of The Joint Commission (**www.jointcommission.org**)

4. Transfer capability to a tertiary care center for further management if indicated after a patient has been evaluated, stabilized, and treatment has been initiated; and
5. Evidence-based treatments and access to appropriate services throughout the acute care hospitalization.

WORKGROUP COMPOSITION

As outlined in the legislation, the workgroup included representatives of emergency department physicians, a representative from the Vermont chapter of the American College of Emergency Physicians (ACEP), neurologists from Fletcher Allen Health Care and Dartmouth Hitchcock Medical Center with stroke expertise, and the American Heart Association/American Stroke Association. The workgroup was chaired by an emergency department medical director and staffed by the Vermont Association of Hospitals and Health Systems. A list of committee members is available in Appendix C.

WORKGROUP ACTIVITIES TIMELINE

- **May 12, 2009: Kick off**. In anticipation of the passage of Act 61, American Heart Association/American Stroke Association representatives and neurologists from Fletcher Allen Health Care and Dartmouth Hitchcock Medical Center joined the quarterly meeting of the Vermont Emergency Department Medical Directors Committee to identify the key steps to developing recommendations. Representatives of the stroke workgroup were identified and a chair was chosen. The group also brainstormed critical elements to include in a survey of hospitals and identified a subcommittee to develop a survey tool.
- **May 12, 2009 – June 23, 2009: Hospital survey developed and fielded.** All hospitals responded.
- **June 25, 2009: Workgroup convened.** The workgroup reviewed the survey data, a rough count of stroke volumes using hospital discharge data, and key clinical guidelines. The workgroup discussed initial recommendations. The workgroup identified the need to gather more information from EMS about screening tools and transport capacity.
- **July 20, 2009: Committee chair and VAHHS staff meet with EMS representatives.** A summary of the key issues is developed for distribution to the entire workgroup.
- **September 15, 2009: Workgroup convened.** The workgroup reviewed CDC stroke volume data presented on a map, thanks to the efforts of the American Heart Association/American Stroke Association. The committee further discussed recommendations.
- **October 16, 2009: Draft report circulated** to workgroup and other stakeholders.
- **November 3, 2009: Workgroup convened** to review and amend draft**.**

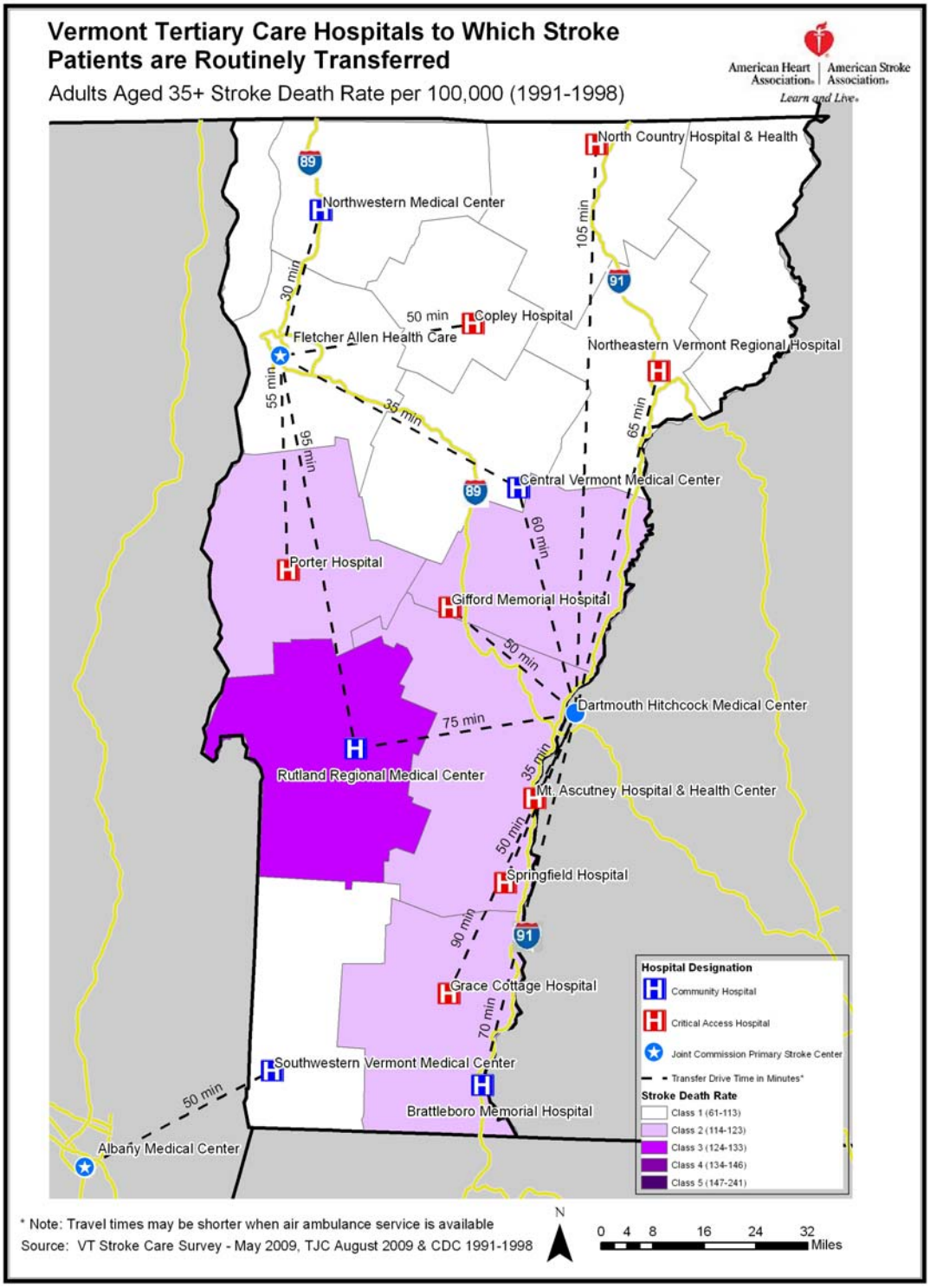
KEY FINDINGS

Emergency Medical Services

Workgroup members consulted the EMS Chief of the VT Department of Health and the President of the Vermont Ambulance Association to better understand emergency transport issues. This identified many complex issues regarding geography, EMS capacity and transportation realities in Vermont weather. Some key findings:

- Most ambulance services do not have the staff or equipment to leave their service area to bring a patient directly to a tertiary care center rather than the local community hospital. Doing so would leave their service areas uncovered for too long.

- Most Vermont ambulance services do not have the clinical expertise or equipment to safely transport a critical care patient for long distances.
- Vermont's EMS infrastructure is fragile. Low patient volumes combined with the high fixed costs of running an ambulance service result in relatively high per-patient costs, yet Medicaid reimburses ambulance services at only 39 percent of Medicare rate. Even Medicare rates typically do not cover costs.
- Primary stroke centers are not available in all regions of the state and EMS bypass of smaller hospitals is not always feasible. This implies the need to improve the ability of community hospitals to provide at least initial stroke care.
- The large ambulance services in the Rutland and Burlington areas use the same stoke screening tool in the field which might serve as a model for a statewide tool.
- There are a few areas in Vermont where the travel time to a tertiary care center versus the travel time to a community hospital would support primary transport to the tertiary care center.
- Dartmouth Hitchcock Medical Center and Albany Medical Center have emergency air transport available to all Vermont hospitals, dependent on weather conditions and call volume.

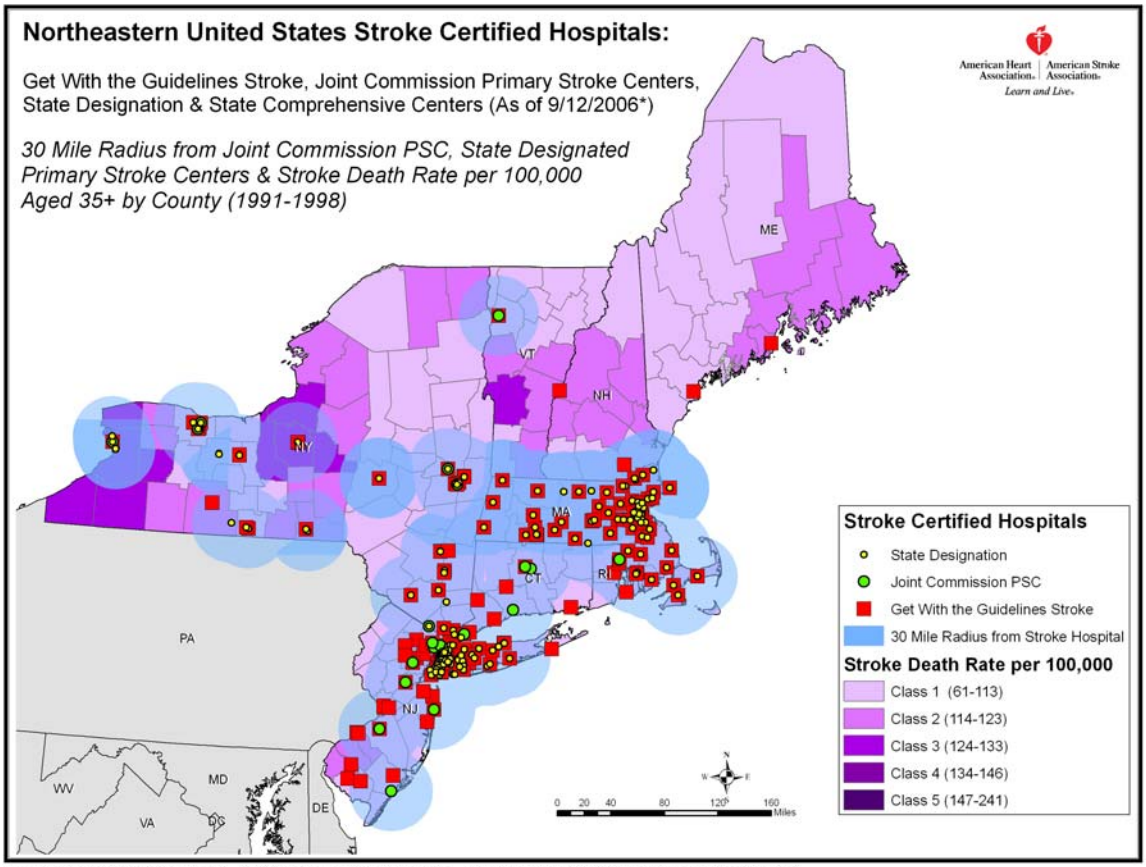

Vermont Tertiary Care Hospitals to Which Stroke Patients are Routinely Transferred
Adults Aged 35+ Stroke Death Rate per 100,000 (1991-1998)
American Heart Association | American Stroke Association
Learn and Live
North Country Hospital & Health
Northwestern Medical Center
105 min
30 min
50 min
Copley Hospital
Fletcher Allen Health Care
Northeastern Vermont Regional Hospital
55 min
35 min
65 min
95 min
Central Vermont Medical Center
60 min
Porter Hospital
Gifford Memorial Hospital
50 min
Dartmouth Hitchcock Medical Center
75 min
35 min
Rutland Regional Medical Center
Mt. Ascutney Hospital & Health Center
50 min
Springfield Hospital
90 min
Grace Cottage Hospital
70 min
Southwestern Vermont Medical Center
50 min
Brattleboro Memorial Hospital
Albany Medical Center
Hospital Designation
Community Hospital
Critical Access Hospital
Joint Commission Primary Stroke Center
Transfer Drive Time in Minutes*
Stroke Death Rate
Class 1 (61-113)
Class 2 (114-123)
Class 3 (124-133)
Class 4 (134-146)
Class 5 (147-241)
* Note: Travel times may be shorter when air ambulance service is available
Source: VT Stroke Care Survey - May 2009, TJC August 2009 & CDC 1991-1998
N
0 4 8 16 24 32
Miles

Hospital Emergency Department Services

The workgroup reviewed The Joint Commission website to identify those hospitals serving Vermont that have achieved certification as a stroke center. The workgroup also developed and fielded a confidential survey of Vermont emergency department medical directors and Dartmouth Hitchcock Medical Center asking questions about the availability of diagnostic services, physician coverage and access to neurology consultations. It was clear that hospitals interpreted some of the questions differently so the results are not entirely consistent. Nonetheless, the survey identified some important issues.

- Of the three tertiary hospitals serving Vermont patients, Fletcher Allen Health Care and Albany Medical Center are certified by The Joint Commission as primary stroke centers.
- All three tertiary hospitals serving Vermont (Dartmouth Hitchcock Medical Center, Fletcher Allen Health Care and Albany Medical Center) have organized stroke programs with on-site fellowship-trained vascular neurologists, neuroradiologists, neurointerventional radiologists and neurosurgeons.
- Two hospital emergency departments are primarily staffed with physician assistants (PAs).
- Many hospitals are relying on neurology consultation services from tertiary facilities. Many community hospital emergency department physicians reported feeling such consultations were essential to their ability to provide some treatments. Even at tertiary care centers, the availability of interventional neuroradiology, neurosurgery and fellowship trained vascular neurology may be limited.
- Many emergency departments cannot accomplish needed imaging in 25 minutes at night and on weekends.
- Most hospitals have access to teleradiology systems that would allow them to share images with off-site consulting neurologists if inter-facility agreements and processes were in place.
- No community hospitals in Vermont are currently using telemedicine for stroke care.
- Few hospitals have inter-facility treatment and transfer protocols with tertiary care centers for stroke care.

A table summarizing the survey results is available in Appendix A.



Source: CDC 1991-1998; AHA & Joint Commission & State Data - * Vermont as of 10/9/09, all others as of 9-12-06

RECOMMENDATIONS

The workgroup examined the information gathered from hospitals and EMS and sought to identify recommendations that would take into account Vermont's rural nature and the resources currently available. It became clear that a model that relies on the routine bypassing of hospitals is not right for Vermont. Instead, Vermont will be best served by a model that gives hospitals access to the tools they need to provide initial standardized, evidence-based care. That said, in a few communities with short transport times to hospitals with greater stroke resources, bypass protocols might be appropriate. Specifically, the workgroup identified the following recommendations:

1. **The workgroup should remain active for at least another year to implement the recommendations below.** A representative from the Albany Medical Center should be invited to participate and this report and subsequent deliverables should be shared with the Veteran's Administration Medical Center in White River.
2. **The workgroup should review the E-911 dispatch system for recognizing and responding to stroke symptoms from EMS calls by March 30, 2010.**
3. **The workgroup should adopt an evidence-based EMS stroke screening tool and treatment protocol for inclusion in the Vermont EMS statewide protocols and develop an implementation plan by March 30, 2010.** The tool will be used primarily to facilitate communication between EMS services and hospitals while patients are en route. This work may lead to recommendations to optimize other EMS protocols that impact stroke care (for example drug infusions and intubations).
4. **Implementation of the EMS stroke screening tool and treatment protocols should be led by EMS district medical advisors** (in many communities that person is also the emergency department medical director.) This will allow each area to appropriately tailor EMS response to local factors such as proximity to a tertiary care center, the level of training of emergency department personnel (i.e., physician or PA) and availability of helicopter transport.
5. **The stroke workgroup should recommend nationally accepted, evidence-based guidelines for acute stroke care by August 15, 2010 for adoption by Vermont hospitals.** These guidelines will be used to develop statewide treatment and transfer protocols between facilities and facilitate communication between hospitals and consulting neurologists. These guidelines will be promulgated by the stroke workgroup.
6. **The workgroup should explore the feasibility of, and barriers to, statewide implementation of teleradiology and telemedicine and develop recommendations by November 15, 2010.** That exploration should include appropriate hospital information technology experts and the Vermont Information Technology Leaders (VITL). More widespread implementation of teleradiology and telemedicine would allow hospitals greater access to neurologic expertise in stroke care.
7. **The workgroup should work with tertiary care centers serving Vermont to better define the consultative expertise in stroke care they can provide to community hospitals** and the attendant inter-facility treatment and transfer protocols.
8. **The feasibility of a quality improvement-focused organization such as the Vermont Program for Quality in Health Care taking over the staffing of the committee should be explored before January 30, 2010**.
9. **The workgroup should monitor the progress of the Centers for Medicaid and Medicare Services requirement that hospitals report on their participation in a "systematic clinical database registry for stroke care"** scheduled for implementation in 2011. Statewide data on the incidence, treatment and outcome of stroke care, collected

using a consistent methodology, are important to hospital's quality improvement efforts. The workgroup should stay abreast of CMS efforts and help prepare hospitals for implementation of the national model.

10. **The workgroup should report again on their progress** to the House Committee on Health Care and the Senate Committee on Health and Welfare by November 15, 2010.

Appendix A: Summary of a Survey of Vermont Emergency Department Medical Directors (Vermont Hospitals)

	Yes	No	N/A
Is your emergency department staffed 24/7 by a physician?	12	2	
Does your emergency department use a triage assessment tool or stroke scale?	11	3	
Does your emergency department have a written protocol for emergent treatment of stroke?	10	4	
Is a neurologist available for stroke consultation 24/7? *(NOTE: This question was almost certainly interpreted differently by different respondents)*	9	5	
Is your hospital able to provide 24/7 non-contrast brain CT within 25 minutes of arrival in the emergency department?	11	3	
Is your hospital able to provide 24/7 brain CT angiography within 25 minutes of arrival in the emergency department?	3	11	
Is your hospital able to provide 24/7 MRI within 25 minutes of arrival in the ED?	1	13	
Is there a mechanism to have CT images read by a radiologist within 20 minutes (total of 45 minutes from arrival)	11	3	
Does your hospital have telemedicine capability to share images with a tertiary care hospital?	5	8	1
Does your local EMS use a stroke assessment tool in the field?	6	8	

Appendix B: Full Text of the Charge to the Workgroup Outlined in Act 61 of 2009

The Vermont Association of Hospitals and Health Systems (VAHHS) is requested to convene a group consisting of emergency room physicians from around the state, including one representative from the Vermont chapter of the American College of Emergency Physicians and at least one representative from the Vermont Emergency Department Medical Directors Committee; neurologists from Fletcher Allen Health Care and Dartmouth Hitchcock Medical Center who specialize in the treatment of strokes; and one representative from the American Heart Association/American Stroke Association. No later than November 15, 2009, VAHHS is requested to provide a report to the House Committee on Health Care and the Senate Committee on Health and Welfare, recommending ways to integrate timely, effective stroke treatment in Vermont considering evidence-based treatments accepted by the American Academy of Neurology or the American College of Emergency Physicians, or both. The report shall include:

(1) information about the capacity of each hospital to provide emergency treatment of strokes following the guidelines accepted by The Joint Commission (TJC), including the services that each hospital offers, the types of relevant providers available at each hospital and the hours of availability, and the challenges posed by emergency transportation systems in Vermont;

(2) recommendations about additional services or infrastructure necessary to ensure that all Vermonters are able to receive the recommended treatment for strokes; and

(3) draft recommendations for the triage, stabilization, and appropriate routing by emergency medical service providers of patients who suffered a stroke, and coordination and communication between hospitals and between treating physicians.

Appendix C: Workgroup Members

Mark R. Depman, MD
ED Medical Director, Central Vermont Medical Center
Stroke Workgroup Chair

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Stroke Workgroup Staff and Key Contact *(802-223-3461 x104; jill@vahhs.org)*

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VT ACEP and Fletcher Allen Health Care Emergency Medicine

Christopher Commichau, MD
Neurology, Fletcher Allen Health Center

Steve Fisher, MD
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Stephen Leffler, MD
ED Medical Director, Fletcher Allen Health Center

Richard Meyer, MD
ED Medical Director, Mt. Ascutney Hospital and Health Center

Nicole Lukas, MA
Director of Advocacy and Public Health
American Heart Association/American Stroke Association

Tim Lukovits, MD
Neurology, Dartmouth Hitchcock Medical Center

Paul Newton, MD
ED Medical Director, North Country Hospital

Denise Normandin, RD
Director of Strategic Health Alliances
American Heart Association/American Stroke Association

Josh Plavin, MD, MPH
Medical Director, Gifford Medical Center

Christopher Schmidt, MD
Emergency Dept. Director, Brattleboro Memorial Hospital

J.F. Subasic, MD
Neurology and Emergency Medicine, Copley Hospital

Appendix D: Sources

Adams, Harold P. Jr. et. al. (2007): Guidelines for the early management of ischemic stoke. *Stroke,* 38, 1655-1711. http://stroke.ahajournals.org/cgi/content/full/38/5/1655

Acker, Joe E. III, et. al. (2007): Implementation strategies for emergency medical services within stroke systems of care *Stroke,* 116, 3097-3115. http://stroke.ahajournals.org/cgi/content/full/38/11/3097

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Schwamm, Lee H. et. al. (2005). Recommendations for the establishment of stroke systems of care. *Stroke***,** 36, 690-703. http://stroke.ahajournals.org/cgi/content/full/36/3/690

Personal communication between Dr. Andrew Bushnell, Vermont ACEP Representative with Rhonda Whitson, RHIA, Clinical Practice Manager, American College of Emergency Physicians confirming that ACEP does not currently have a clinical stroke policy.